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## Burkhardt Monitoring Service

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July 10, 1996

William Caton  
Acting Secretary  
Federal Communications Commission  
1919 M Street, N.W.  
Washington, D.C. 20554

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re: Comments on Fifth NPRM  
MM Docket 87-268

Dear Mr Caton:

Attached hereto are 12 copies, including original of Comments on the Fifth (5th) Further Notice of Proposed Rule Making of MM Docket No. 87-268.

If there are any questions, please do not hesitate to contact the undersigned.

Sincerely,

Edward E. Burkhardt

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Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554

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In the matter of

Advanced Television Systems  
and Their Impact Upon the  
Existing Television Broadcast  
Service

MM Docket No. 87-268

BURKHARDT MONITORING SERVICE  
COMMENTS ON THE FIFTH  
NOTICE OF PROPOSED RULE MAKING  
ADOPTED BY THE COMMISSION MAY 9, 1996

**COMMENTS**

Burkhardt Monitoring Service, Glen Allen, Virginia, operates a commercial frequency measurement service. This service has been in business since 1985, and is a continuation of other services operating since 1935. This company provides frequency measurements and other related signal analyses to AM-FM-TV and shortwave broadcasters in a wide area of the United States to assure their compliance with applicable rules of the Commission as related to maintenance of frequency tolerance. I, Edward E. Burkhardt, am the sole proprietor and operator, and the following comments are based upon my personal observations and experience. I have been a radio engineer since 1955 and my qualifications are a matter of record with the Federal Communications Commission.

The comments herein address only paragraph 57 and footnotes 59 and 60 (page 22) of the Commission's Fifth Further Notice of Proposed Rule Making adopted May 9, 1996. To prevent interference to NTSC receivers from DTV stations operating on the first adjacent channel above the NTSC station, the Commission has proposed requiring the ATSC DTV station pilot frequency be located 5.082138 MHz above the visual carrier of the lower adjacent channel NTSC station. This difference of 5.082138 MHz would need to be maintained within a tolerance of  $\pm 3$  Hz.

If the NTSC and DTV transmitters are collocated, frequency control devices can be utilized that should produce a DTV pilot frequency mathematically related to the NTSC visual carrier frequency. Normal frequency drifting of the NTSC visual carrier would cause the DTV pilot frequency to also drift, thus resulting in a 5.082138 MHz frequency difference.

In cases where the NTSC and DTV transmitters are not collocated, a multitude of problems of precise frequency offset between the NTSC visual and DTV pilot carriers arise. Either one of the stations must slave to the other's operating frequency, or "ultra stable precise frequency control" must be used by both stations in order to comply.

If "ultra precise frequency control" is used at both transmitters, serious 'color stripe' interference will result if either station's ultra precise frequency control fails. In such failure cases, the Commission should establish protection procedures for the NTSC station, such as immediate power reduction of the DTV station, and/or curtailment of DTV operations.

In cases where an off air signal reference sample is used to control the operating frequency of one transmitter, non-constant multipath propagation, especially in the UHF region can cause short term frequency changes. Aircraft can cause short-term frequency anomalies on the order of two to fifteen Hertz per second frequency changes in the UHF region. Such short term changes would place the difference of the carriers outside the proposed  $\pm 3$  Hz limit.

Verification of compliance is also a matter of concern. This company and its predecessors have provided accurate and reliable frequency measurements to the broadcast industry for over fifty years. A poll of other measurement services indicate that about seventy-five percent of full power television stations in the United States depend on measurement services on a regular basis. On the main, digital frequency counters have been found unreliable or inaccurate enough for the demands required by this NPRM, namely reliable and accurate readings to one Hertz in the UHF region.

Measurement services traditionally determine operating frequencies off air and provide low cost services up to 300 miles - 500 km from the monitoring stations fixed location. Only one service is known to provide monthly measurements from a mobile van. In order to provide service to the DTV broadcaster, the Commission must understand some of our service limitations. The effective radiated power of the pilot carrier of the DTV station must be comparable to existing NTSC aural power levels. If not, some broadcasters may desire a short-term increase in pilot power to facilitate frequency measurement by the off the air method.

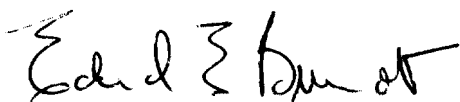
A means of identification of the DTV pilot must be provided, such as brief amplitude or frequency changes of the pilot on demand in order to properly flag the pilot to be measured. Because measurement services handle as many as seven stations per channel, this 'flagging' identification is of utmost importance.

The Commission should also be aware that a number of UHF stations have a serious frequency drift problem, some on the order of a dozen Hertz per second, often drifting in cycles of a hundred Hertz total. Crystal control oven heater failure is also a serious problem. It is not uncommon to find a station that has drifted out of NTSC frequency tolerance because of an oven heater problem. The vast majority of these frequency control problems exist in the UHF region. The state of the art of independent frequency control  $\pm 3$  Hz in the UHF television bands does not exist at this time.

The Commission should also consider the impact of the above on the low power and translator service.

It is felt that licensing DTV stations to the first adjacent channel above NTSC stations within the coverage area of an NTSC station is not advisable.

Respectfully Submitted,



Edward E. Burkhardt

Date: July 10, 1996